CUSTOMER NO.: 24498
Serial No.: 10/519,000
Final Office Action dated: 06/19/09
Response dated: 09/11/09

PATENT
PU020292

Remarks/Arguments

The Final Office Action, mailed June 16, 2009, has been reviewed and carefully considered. Reconsideration of the above-identified application in view of the following remarks is respectfully requested. Claims 1–24 remain pending in the application.

Claims 1–24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over International Patent Publication WO 08/16040 to Adams (hereinafter "Adams") in view of U.S. Patent No. 5,956,674 to Smyth (hereinafter "Smyth") and in further view of European Patent Publication No. 0453063 to Fletcher (hereinafter "Fletcher").

Claim 1 recites, *inter alia*, "wherein . . . the time separating a first set of successive identified transitions is a first measurement of said estimated bit time." Claims 11, 20, 23, and 24 recite analogous language. The Examiner asserts that Adams teaches this element, but in support the Examiner only makes general references to the basic features of biphase encoding. The Examiner does not point to any reference in Adams which describes a *measurement* for an estimated bit time. Generally speaking, if a device does not know what the bit time of a transmission is, it must estimate that bit time from the transmission itself. The claims present one technique for doing so, whereas Adams presents a different approach.

How the first estimated bit time is measured is of particular relevance, because very little if any no information is available at that point in time. The present invention claims using the *measured* time between the first transitions to estimate the bit time, whereas Adams uses an assumed initial frequency.

As described in applicants' previous response, Adams describes a technique for parsing the pulse lengths of a biphase data stream on page 8. Adams sets three taps to a signal at half-multiples of a time T. This time T is defined as "the period of time for one cell in the biphase-mark encoded data input." (Adams, p. 8, lines 11–12) Adams adjusts the time T by adjusting the shift register's clock frequency. (Adams, p. 9, lines 9–12) Adams does this using a servo loop that performs continual adjustments, slowly increasing the frequency when processing data, and quickly dropping the frequency when a preamble is detected. (Adams, pp. 9–11) In particular, Adams describes how the circuit initially responds, giving examples of an initial frequency (and hence, an initial bit time) which is too high, and an initial frequency which is too low. (Adams, p. 11, lines 1–13) Adams does not describe any inventive means for determining the initial frequency, nor for determining an initial time T,

and it must therefore be presumed that Adams relies on the prior art technique it described for selecting an initial frequency — one based upon the known frequency of the input signal. (Adams, p. 5, lines 18–24)

The Examiner has not contradicted this analysis. Instead the Examiner has asserted that, "Adams explicitly teaches a period of time detected between transitions within a frame of AES biphase data, wherein this time is the time of incoming bits i.e. bit time." (See the Official Action, page. 5, citing Adams, p. 8, lines 1–21) The cited portion of Adams, relied upon by the Examiner, shows that different cells may be characterized as being .5T, 1T, or 1.5T in length. The Examiner uses this to assert that Adams detects a period of time between transitions.

However, such detection *is not used to make a first measurement of the estimated bit time*. The cited portion of Adams *uses a bit time* (T) to make its measurement. The bit time is adjusted, as noted above, by changing the clock frequency. This passage fails, as does every other passage in Adams, to describe any new method for producing an initial frequency, and hence an initial bit time. As noted above, Adams therefore is limited to the prior art method of determining this quantity that is set forth in its description of the prior art. Adams, p. 5, lines 18–24.

Adams does not *measure* the time between the first transitions in order to estimate bit time. Instead, Adams merely uses a standard frequency to determine its initial bit time. Subsequent detection of bits based on the bit time does not and cannot represent an estimation of the bit time. Thus, Adams does not disclose or suggest that a first measurement for an estimated bit time is the time separating a first set of successive identified transitions.

The Fletcher reference fails to cure the deficiencies of Adams. Fletcher's estimation of bit times is unreliable initially. (Fletcher, col. 3, lines 30–52) Fletcher teaches setting an initial value for its average bit time to be zero. (Fletcher, col. 3, lines 32–34) Because this results in poor behavior initially, Fletcher employs a fixed threshold comparator 20 which essentially sets a minimum bit time that is roughly equal to the shortest expected pulse. (Fletcher, col. 3, lines 47–50) This threshold allows Fletcher to function while its average builds up from the initial value of zero, but ultimately decreases the flexibility as it sets a hard limit on the system's functional sampling rate, beyond which the threshold would improperly interpret all pulse lengths as "A" pulses.

Fletcher explicitly states that the first measurement for its average, and hence for its estimated bit time, is *zero*. Therefore it is respectfully asserted that Fletcher fails to disclose or suggest a first measurement for an estimated bit time being the time separating a first set of successive identified transitions.

It is worth mentioning additionally that Smyth fails to cure the deficiencies of Adams and Fletcher. The Examiner describes Smyth at length, but does not set forth any way in which Smyth might describe making an estimate of bit time. Smyth is not directed at all to biphase encoding, and as such, the need to estimate a bit time does not arise. It is therefore respectfully asserted that Adams, Fletcher, and/or Smyth, taken alone or in any combination, fail to disclose or suggest a first measurement for an estimated bit time being the time separating a first set of successive identified transitions.

Furthermore, claim 23 recites, *inter alia*, "estimating minimum and maximum bit window times." Claim 9, 19, and 24 recite analogous language. The Examiner asserts that this element is disclosed by Adams in the discussion of the shift register and FIG. 11. The Examiner goes on in argument to state that Smyth teaches "windows."

However, the Examiner has not shown that Adams or Smyth discloses or suggests *estimating* minimum and maximum bit window times. Simply showing that a window has a maximum and a minimum is insufficient to read on this claim language. Adam's shift register, addressed in detail above, is an attempt by Adams to discriminate between different pulse lengths. Adams makes use of delay taps, with the delay length based on a continually adjusting servo loop. These taps do not constitute minimum or maximum bit window times, and therefore Adams does not estimate such bit window times.

In contrast, the present invention constructs a timing window based on an estimated bit time. In order to estimate a bit time, a bit window is estimated, for example, as described in the present application, pages 11 and 12. The bit window and timing window are therefore ranges which represent different quantities. Adams does not have any analogue for bit window times — as noted above, Adams determines a bit time T by a greatly different mechanism. As such, Adams never discloses or suggests *estimating* bit window times.

Smyth cannot cure this deficiency. The Examiner states, "Smyth has been incorporated to further teach ... the use of largest and smallest bit window times." The Examiner goes on to describe how Smyth goes about selecting a window size. However, it must first be noted that Smyth's window is not in any way the "segment from a data stream

which contains the data of interest" that the Examiner suggests. Instead, "window size" in the context of Smyth refers to a number of PCM samples that go into a particular frame. Smyth's window is not a range which contains an important quantity, but is instead simply a determination of how large a frame will be. (*See* Smyth, col. 5, lines 52–67) As a result, it is clear that Smyth does not disclose or suggest estimating window times at all.

Even assuming, *arguendo*, that the Examiner's interpretation of Smyth were reasonable, Smyth fails to show an estimation. The difference between *selection* and *estimation* is of particular importance here. In Smyth, a window size is *selected* to optimize performance. Smyth thereby chooses the bounds of its window in order to tune the size of frames. In contrast, the present invention *estimates* minimum and maximum bit window times. These are not quantities which are selected, but instead represent guesses at the range over which incoming bit might arrive. The difference between these two approaches is stark. Smyth selects a window time so that the frames it produces behave in a certain way, while the present invention estimates a bit window time so that it can better detect incoming data. In Smyth, everything is under the system's control or may be reacted to in a fixed way (i.e., if the compression rate changes, the window may be increased). In the present invention, the incoming bit times are not within the system's control and must be estimated as they arrive.

It is therefore respectfully asserted that Smyth fails to disclose or suggest *estimating* maximum and minimum bit window times.

Fletcher fails to cure the deficiencies of Adams and Smyth in this respect. Fletcher's technique for estimating bit times does not rely on bit windows, but instead builds a bit time estimate progressively with the average. Because Fletcher takes an alternate approach for estimating bit times, Fletcher has no need for bit window times, and therefore it is respectfully asserted that Fletcher does not disclose or suggest estimating minimum or maximum bit window times.

It is therefore respectfully asserted that Adams, Fletcher, and/or Smyth, taken alone or in any combination, fail to disclose or suggest estimating minimum or maximum bit window times.

Claim 23 further recites, "constructing a bit window from said minimum and maximum bit window times." Claim 9, 19, and 24 recite analogous language. The Examiner asserts that these elements are disclosed by Adams in its summary.

The portion of Adams which the Examiner cites refers to "a coding scheme having a maximum pulse width." However, this section simply describes the general structure of biphase encoded data and says nothing regarding constructing a bit window, whether from minimum or maximum bit window times, or from any other value.

Furthermore, as noted above, Adams determines its time T by a greatly different mechanism from the present invention and, as such, Adams never discloses or suggests estimating minimum or maximum bit window times. Adams therefore also fails to disclose or suggest constructing a bit window from these minimum and maximum bit window times.

Presumably the Examiner again relies on Smyth to deal with this element. However, as noted above, Smyth does not disclose or suggest bit window times, and further does not disclose or suggest *estimating* bit window times, and hence does not use the recited minimum and maximum. Even if it did so, however, Smyth clearly does not disclose or suggest constructing a window from a minimum and maximum time.

Instead, Smyth describes only a "window size." As noted above, the window size is simply a number of samples — it does not in any way describe a range. There is no indication whatsoever that this size is based upon a known maximum and minimum, as Smyth's window size is a simple integer (i.e., 256, 512...). Smyth describes only a single quantity — the size — which is changed as needed based on such factors as compression. It is therefore respectfully asserted that Smyth does not disclose or suggest constructing a bit window from minimum and maximum bit window times.

Again, Fletcher fails to cure the deficiencies of Adams. Because Fletcher takes an alternate approach for estimating bit times, as noted above Fletcher has no need bit window times, and therefore it is respectfully asserted that Fletcher does not disclose or suggest constructing a bit window.

For at least the above reasons, it is respectfully asserted that Adams, Fletcher, and/or Smyth, taken alone or in any combination, fail to disclose or suggest all of the elements of claims 1, 11, 20, 23, and 24. It is therefore believed that claims 1, 11, 20, 23, and 24 are in condition for allowance. Furthermore, claims 2–10, 12–19, and 21–22 depend from claims 1, 11, and 20 respectively, and therefore include all of the elements of their parent claims. It is therefore believed that claims 2–10, 12–19, and 21–22 are also in condition for allowance. As noted above, claims 9 and 19 include patentable subject matter beyond that present in claims 1 and 11. It is therefore believed that claims 9 and 19 are separately patentable.

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Conclusion

In view of the foregoing, applicants solicit entry of this amendment and allowance of the claims. If the Examiner cannot take such action, the Examiner should contact the applicants' attorney at (609) 734-6820 to arrange a mutually convenient date and time for a telephonic interview.

No fees are believed due with regard to this response. However, if there is a fee, please charge the fee and/or credit any overpayment to Deposit Account No. **07-0832.**

Respectfully submitted,

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